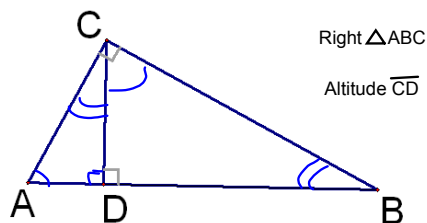


7-3 Use Similar Right Triangles (Geometric Mean)



What are the similar triangles?

$$\triangle ABC \sim \triangle ACD \sim \triangle CBD$$

$$\frac{AB}{AC} = \frac{BC}{CD} = \frac{AC}{AD} \quad \frac{AC}{CB} = \frac{CD}{BD} = \frac{AD}{CD}$$

$$\frac{AB}{CB} = \frac{BC}{BD} = \frac{AC}{CD}$$

Theorem 7-5--If the altitude is drawn to the hypotenuse of a right triangle, then the 2 triangles formed are similar to each other and the original triangle.

Geometric Mean (review)

$$\frac{r}{s} = \frac{s}{t} \quad s \text{ is the geometric mean}$$

Find the geometric mean between 3 and 8.

$$\frac{3}{x} = \frac{x}{8} \quad x^2 = 24$$

$$x = \sqrt{24}$$

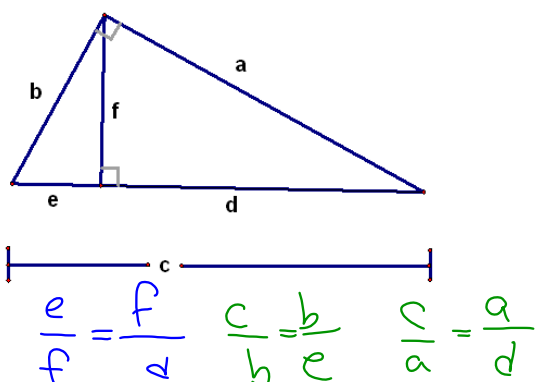
Find the geometric mean between 9 and 14.

Ratios from the triangle. Do you see any g. means?

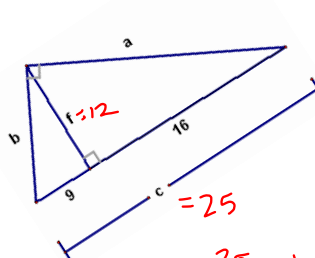
Theorem 7.6--Geometric Mean (altitude)

Theorem---In a right triangle, ...the altitude is the geometric mean b/w segments of hypotenuse

Theorem 7.7-Geometric Mean (leg) Theorem---In a right triangle,....each leg is the geometric mean b/w the hypotenuse and the segment of the hypotenuse that is adjacent to the leg.



Example 1



Find
 $a = 20$
 $b = 15$
 $c = 25$
 $f = 12$

$$\frac{9}{f} = \frac{f}{16}$$

$$\sqrt{f^2} = \sqrt{9 \cdot 16}$$

$$\frac{25}{b} = \frac{b}{9}$$

$$\sqrt{b^2} = \sqrt{9 \cdot 25}$$

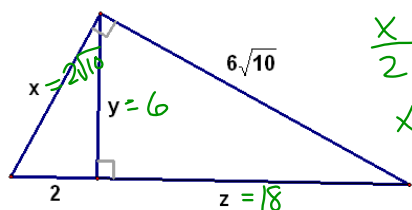
$$15$$

$$\frac{25}{a} = \frac{a}{16}$$

$$a^2 = 16 \cdot 25$$

$$a = 20$$

ex. 2



$$\frac{x}{2} = \frac{20}{x}$$

$$x^2 = 40$$

$$x = 2\sqrt{10}$$

$$\frac{2}{y} = \frac{y}{18} \quad \frac{(2+z)}{6\sqrt{10}} = \frac{6\sqrt{10}}{z}$$

$$y^2 = 2 \cdot 18$$

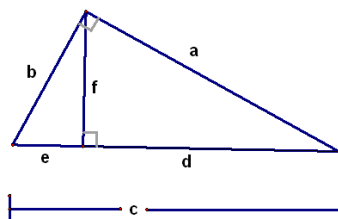
$$y = 6$$

$$2z + z^2 = 360$$

$$z^2 + 2z - 360 = 0$$

$$(z + 20)(z - 18) = 0$$

$$z = -20 \quad z = 18$$



$$\frac{c}{b} = \frac{b}{e} \quad \frac{c}{a} = \frac{a}{d}$$

$$b^2 = c \cdot e \quad a^2 = c \cdot d$$

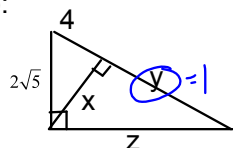
$$a^2 + b^2 = c^2$$

$$cd + ce = c^2$$

$$c(d+e) = c^2$$

$$c \cdot c = c^2$$

Do:



$$\frac{5}{z} = \frac{z}{1}$$

$$z = -\sqrt{5}$$

$$\frac{4}{x} = \frac{x}{y=1} \quad \frac{4+y}{2\sqrt{5}} = \frac{2\sqrt{5}}{4}$$

$$x = 2 \quad y = 1$$

HW

p454

13-18, 21-23, 27

Keep answers in simplified radical form.